NORTHROP GRUMMAN

DEFINING THE FUTURE

Aircraft w/Viper Strike — Transformational Weapon System for Today's Operational Environment

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Viper Strike Overview

Diameter	5.5 in.
Wingspan	36 in.
Length	36 in.
Weight	44 lb.
Glide Ratio	10:1
Warhead	6 lb.

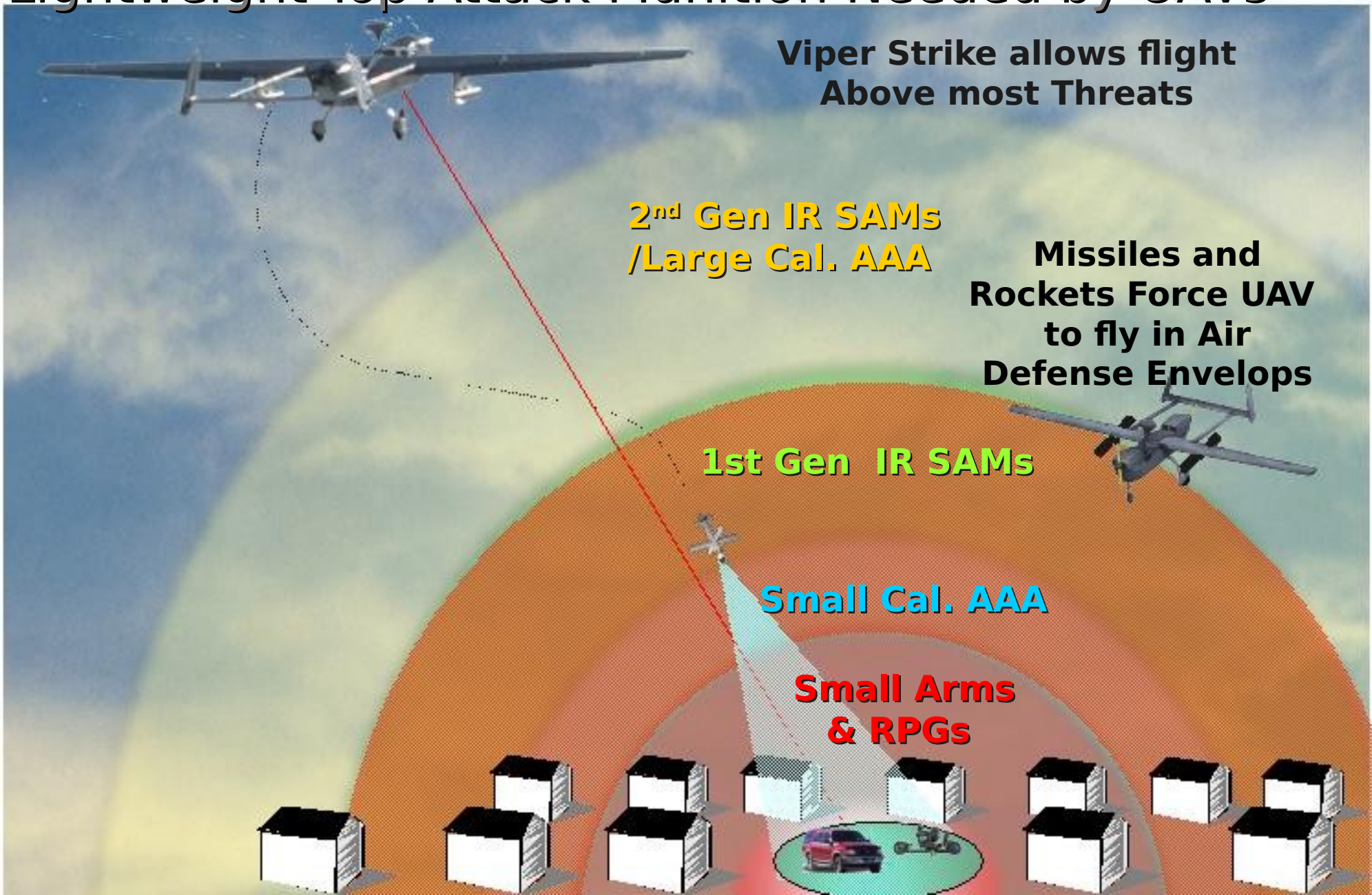
- **Discrete effects precision munition**
  - **Semi-active laser (SAL) seeker**
  - **Near 0 CEP**
  - **Small warhead**
  - **Hit-to-kill**

  } **Low Collateral Damage**
- **Production airframe / seeker**
- **Successful Army demo's (9 for 9)**

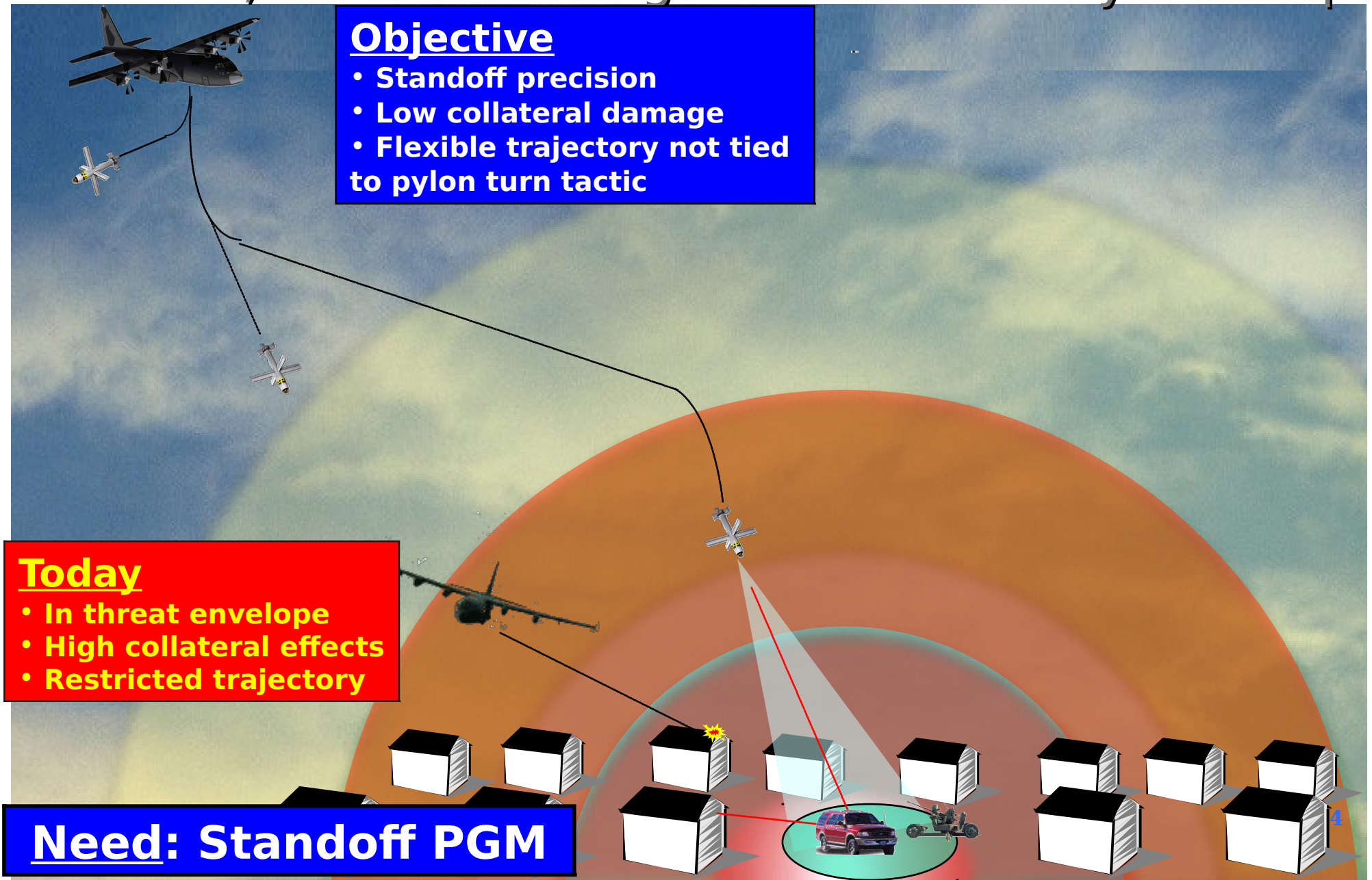
Path Ahead

• GPS	Extend range	'04
• Frag belt	Improved vs. soft targets plus less than lethal mode	'05
• Datalink	Max range moving targets plus multiple near-simultaneous target attack	'06

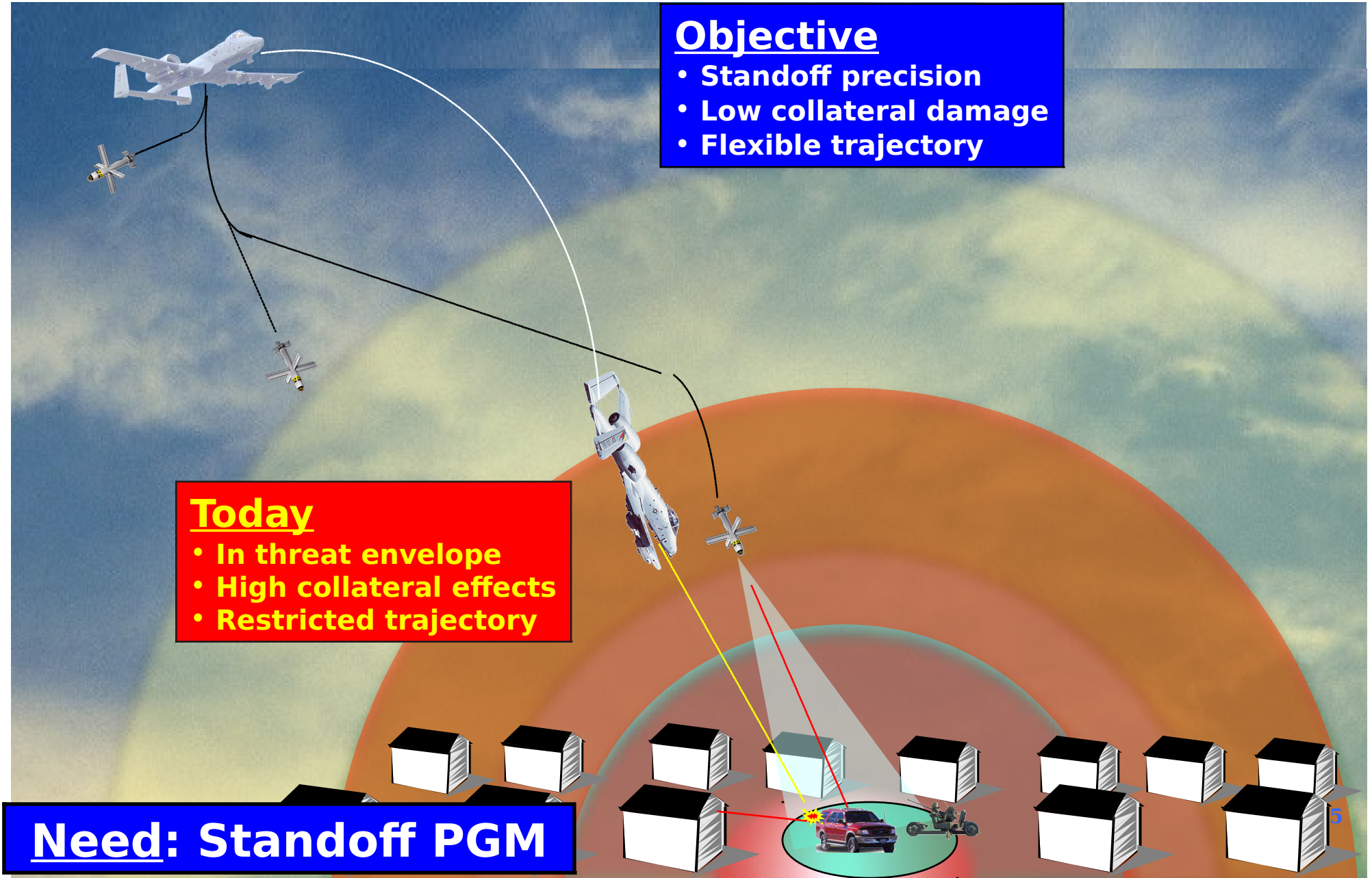
Lightweight Top Attack Munition Needed by UAVs



Standoff, Internal Carriage PGM Needed by Gunship

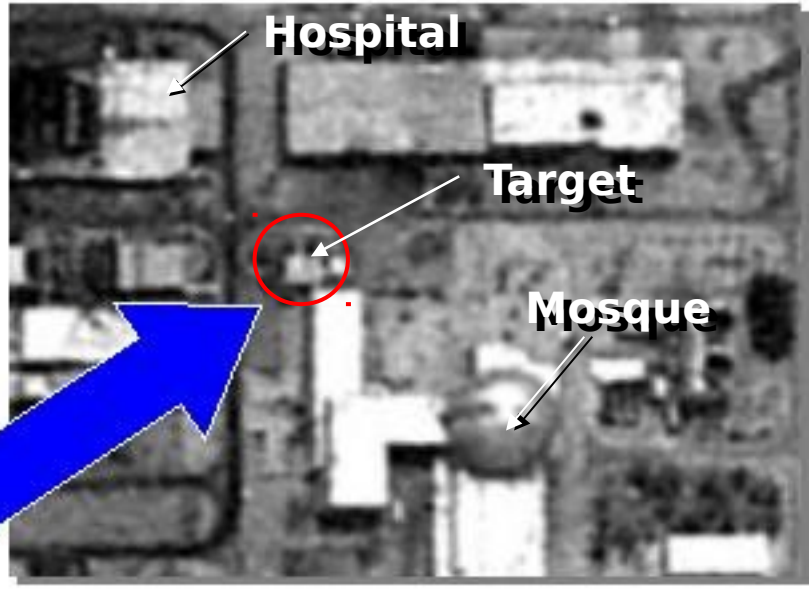


Other Aircraft Have Similar Needs



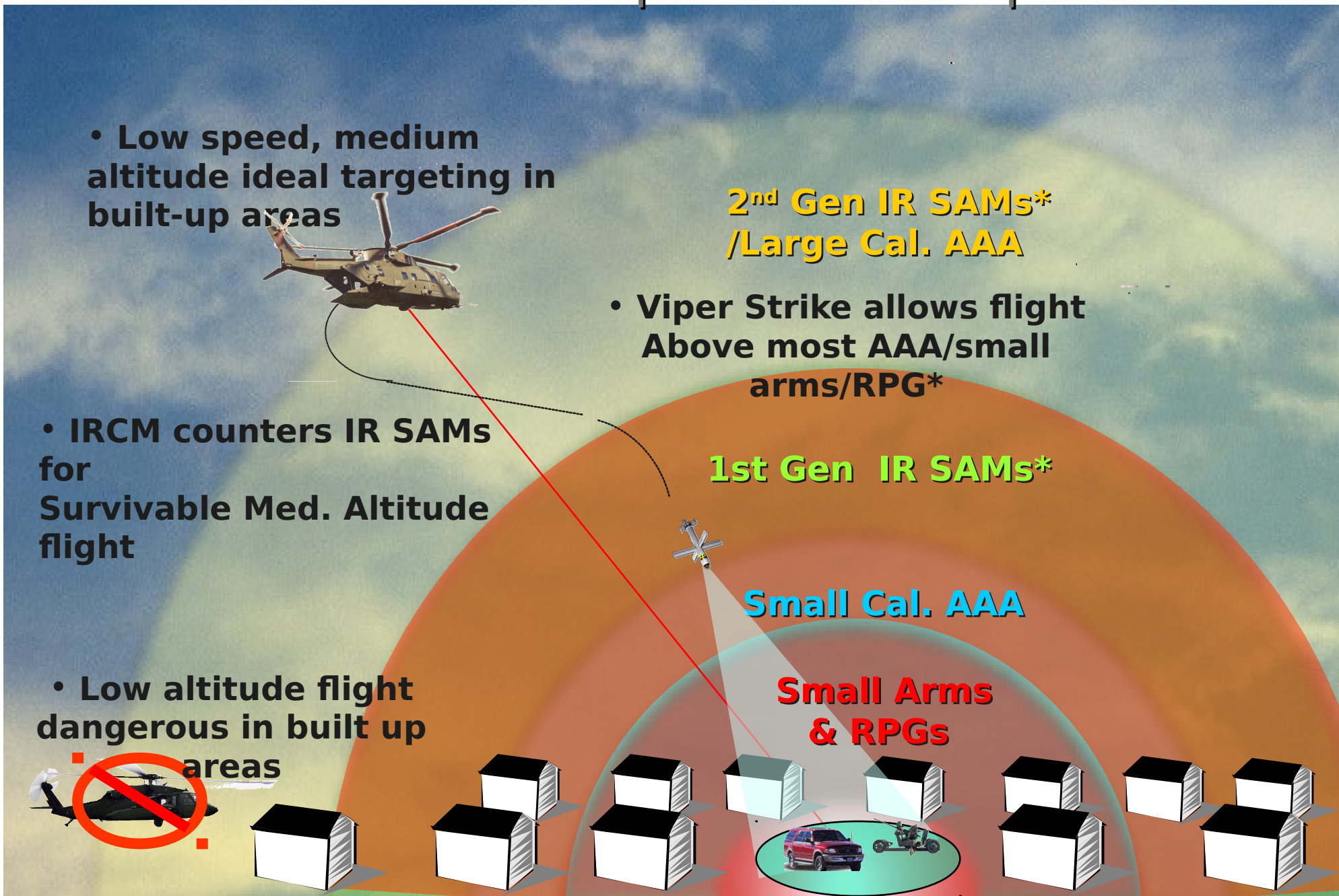
Viper Strike–Sized for Today's Environment

Warhead		Range
500 lb.	**GBU-12** Small CEP	X
500 lb.	**JDAM** Variable CEP*	X
250 lb.	**SDB** Variable CEP*	10X
6 lb.	**Viper Strike** Small CEP	5X

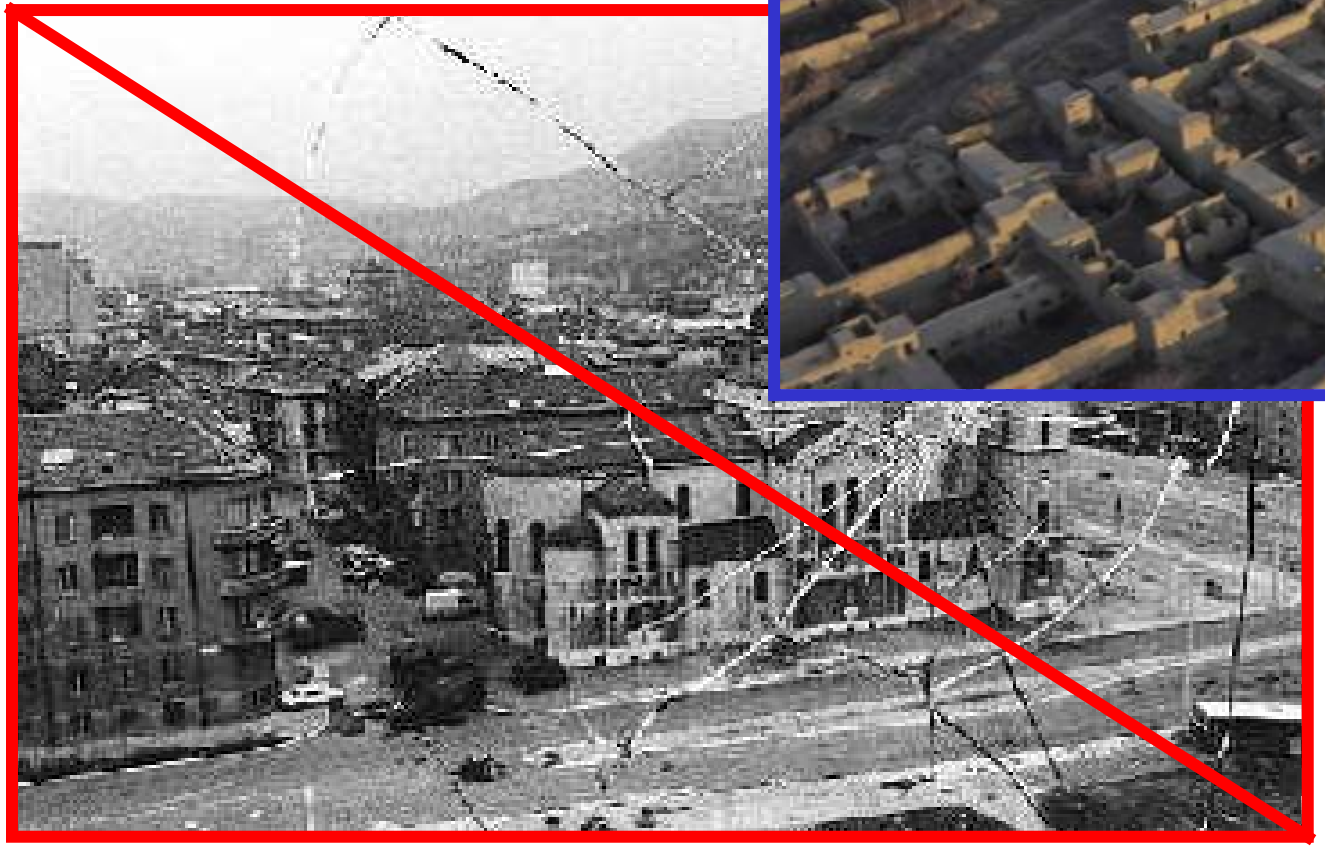


*Targeting Sensor Dependent

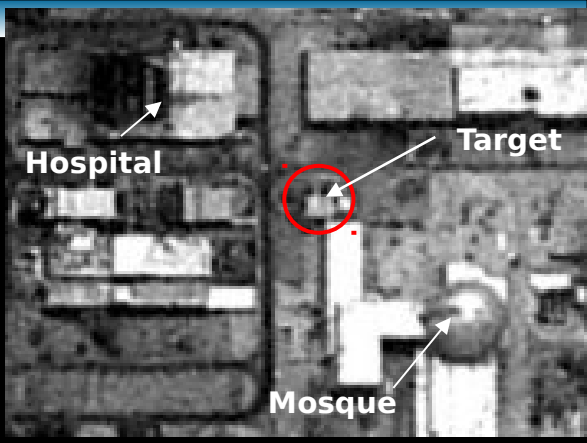
Viper Strike Top Attack /Medium Altitude Delivery Preferred for Helicopters in Built-up Areas


• Low speed, medium altitude ideal targeting in built-up areas
2nd Gen IR SAMs* /Large Cal. AAA
• Viper Strike allows flight Above most AAA/small arms/RPG*
• IRCM counters IR SAMs for Survivable Med. Altitude flight
1st Gen IR SAMs*
Small Cal. AAA
• Low altitude flight dangerous in built up areas
Small Arms & RPGs

Medium Altitude Preferred for in Built-up Areas



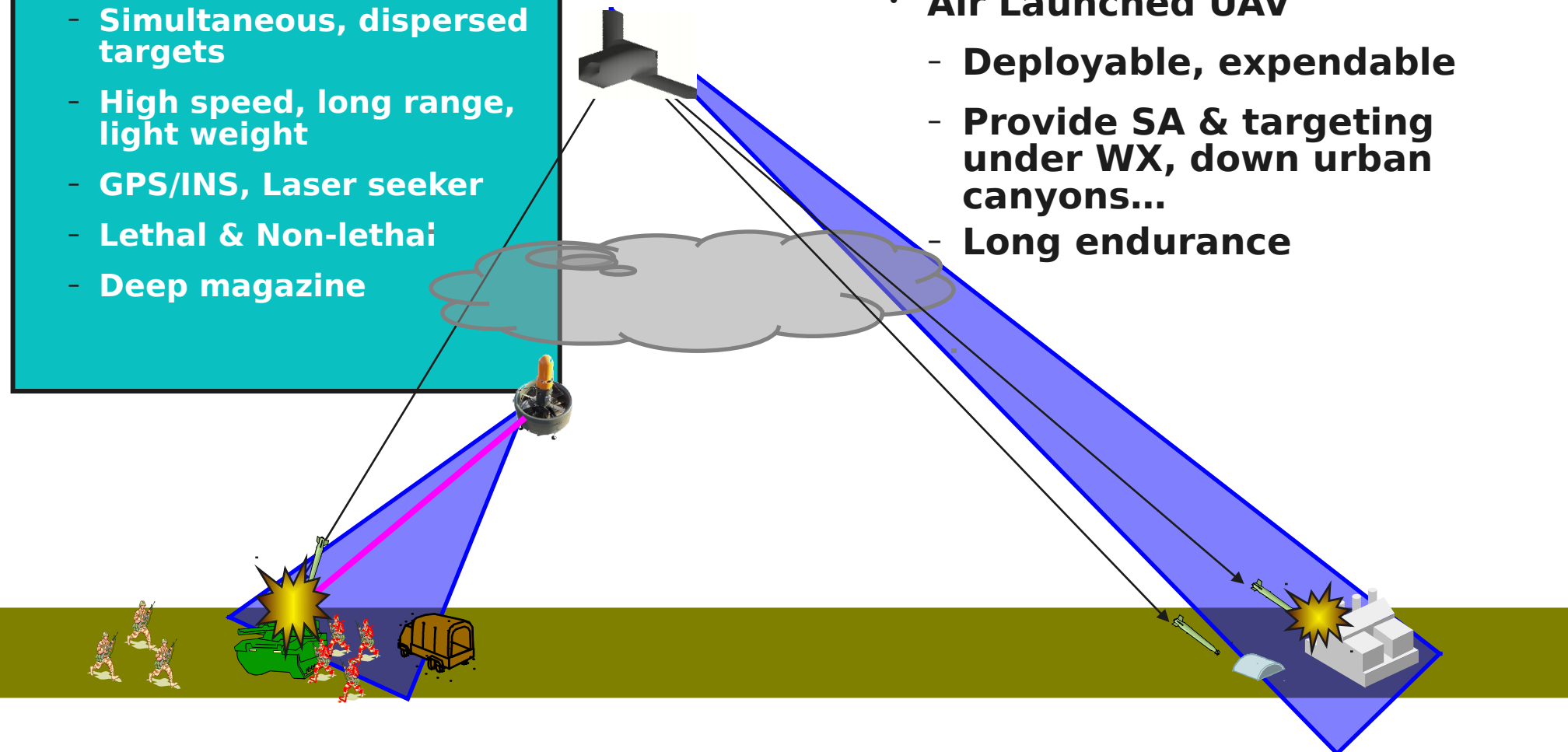
Counter Mortar Conop



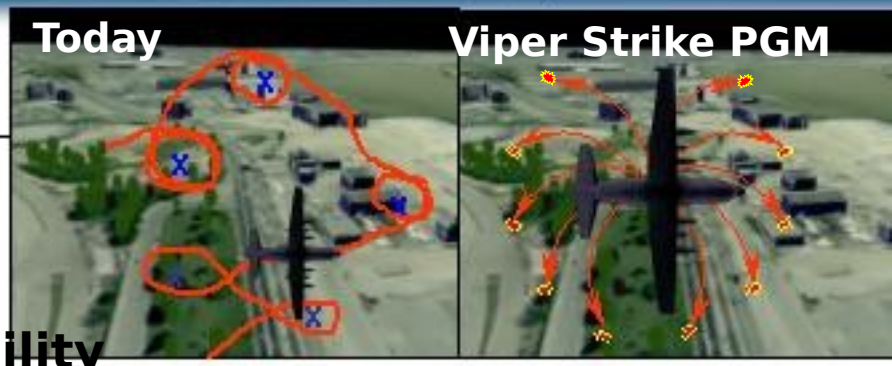
Next Generation Gunship (NGG) CONOPS

- **Concepts of Operation**
  - **Persist in target area 8 hr.**
  - **Humans in the loop**
  - **Precision Guide Munition**
  - **Simultaneous, dispersed targets**
  - **High speed, long range, light weight**
  - **GPS/INS, Laser seeker**
  - **Lethal & Non-lethal**
  - **Deep magazine**

- **Onboard primary sensors**
  - **EO/IR**
  - **SAR, GMTI radar**
- **Air Launched UAV**
  - **Deployable, expendable**
  - **Provide SA & targeting under WX, down urban canyons…**
  - **Long endurance**

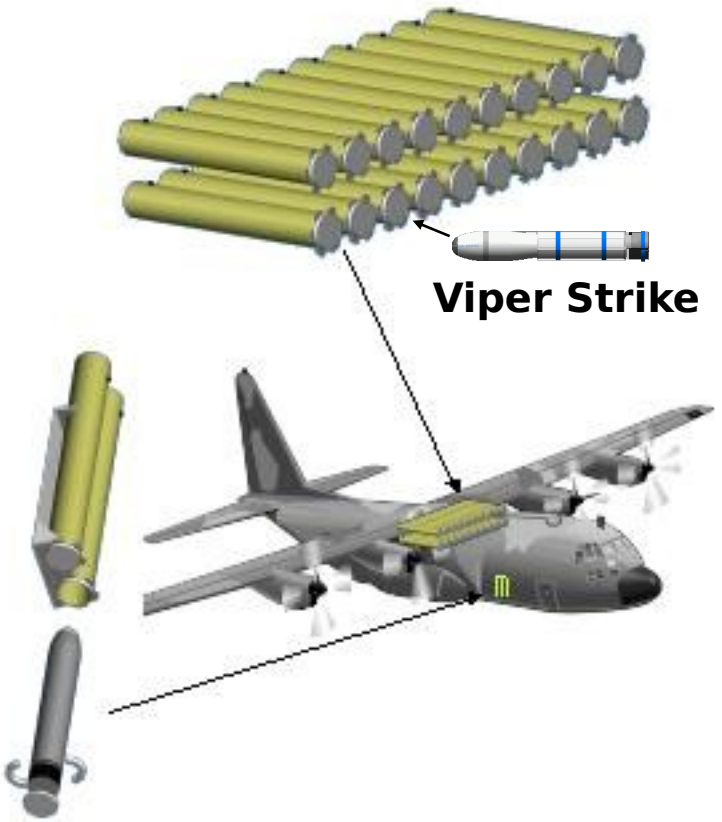


AC-130 & Viper Strike

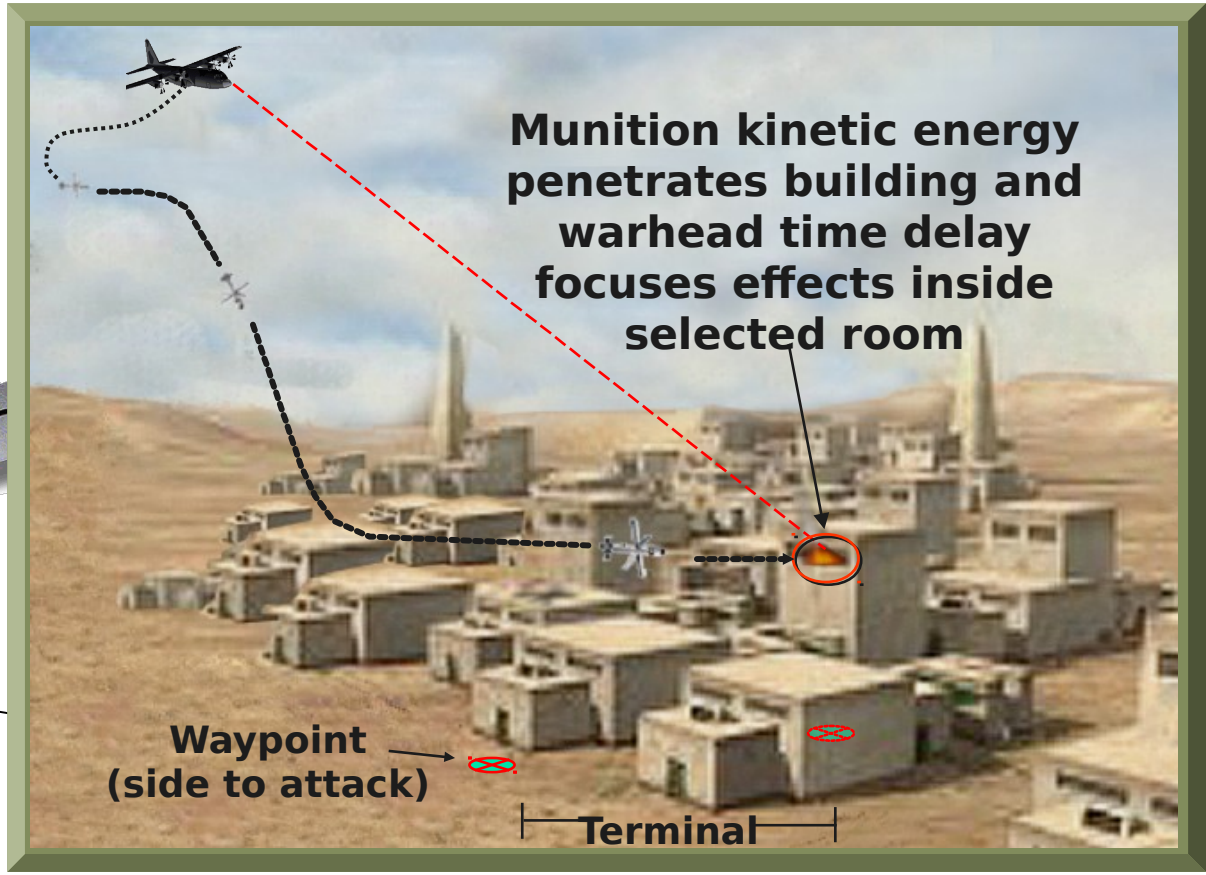


- **Viper Strike - significant benefit with minimal aircraft impact**
  - **– Medium altitude/standoff survivability**
  - **– Responsive firepower: multiple, near-simultaneous attacks over xxxx km² area**
  - **– Internal carriage/ manportable**

- **Viper Strike - Joint application precision munition for today's operational environment**
  - **Very low collateral damage**
  - **Operator in control from launch to impact**
  - **Flexible trajectory (shallow or steep)**
    - **– Urban**
    - **– Complex terrain, high altitude**
  - **Target set: moving/stationary**



Viper Strike Improvement: Multi-Target Warhead


Munition kinetic energy penetrates building and warhead time delay focuses effects inside selected room
Waypoint (side to attack)
Terminal

Programmable Time Delay:

Same Warhead
→Airframe Mod

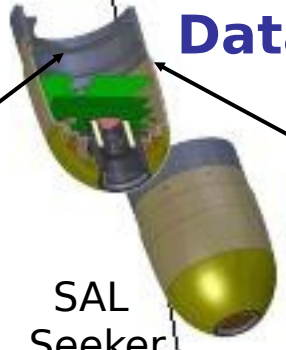
*Kinetic Energy K

Viper Strike Improvement: GPS and Datalink

GPS: Extended Range

CSEL

SAASM GPS

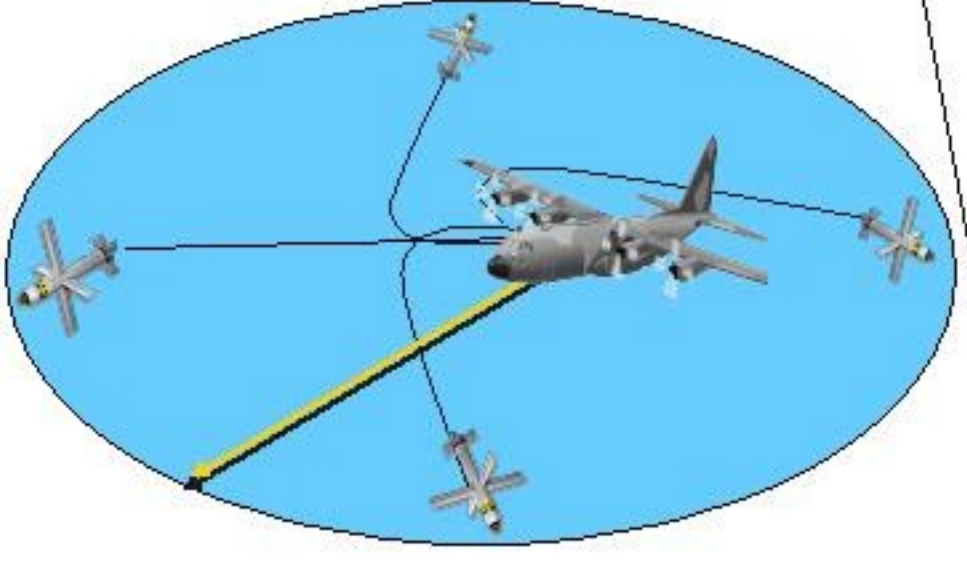


SAL Seeker

Datalink: Moving Targets + Near, Simultaneous Target Attack

Datalink

Global Grid Datalink



- *Many munitions inflight*
- *Software reprogrammable (JTRS SCA migration)*

Combat Controllers

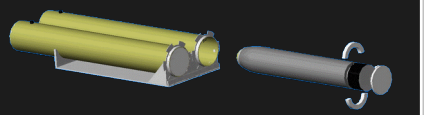
Weapon communicates “in terminal” to indicate when to laze

Concept of Operations

– Med. Altitude Release

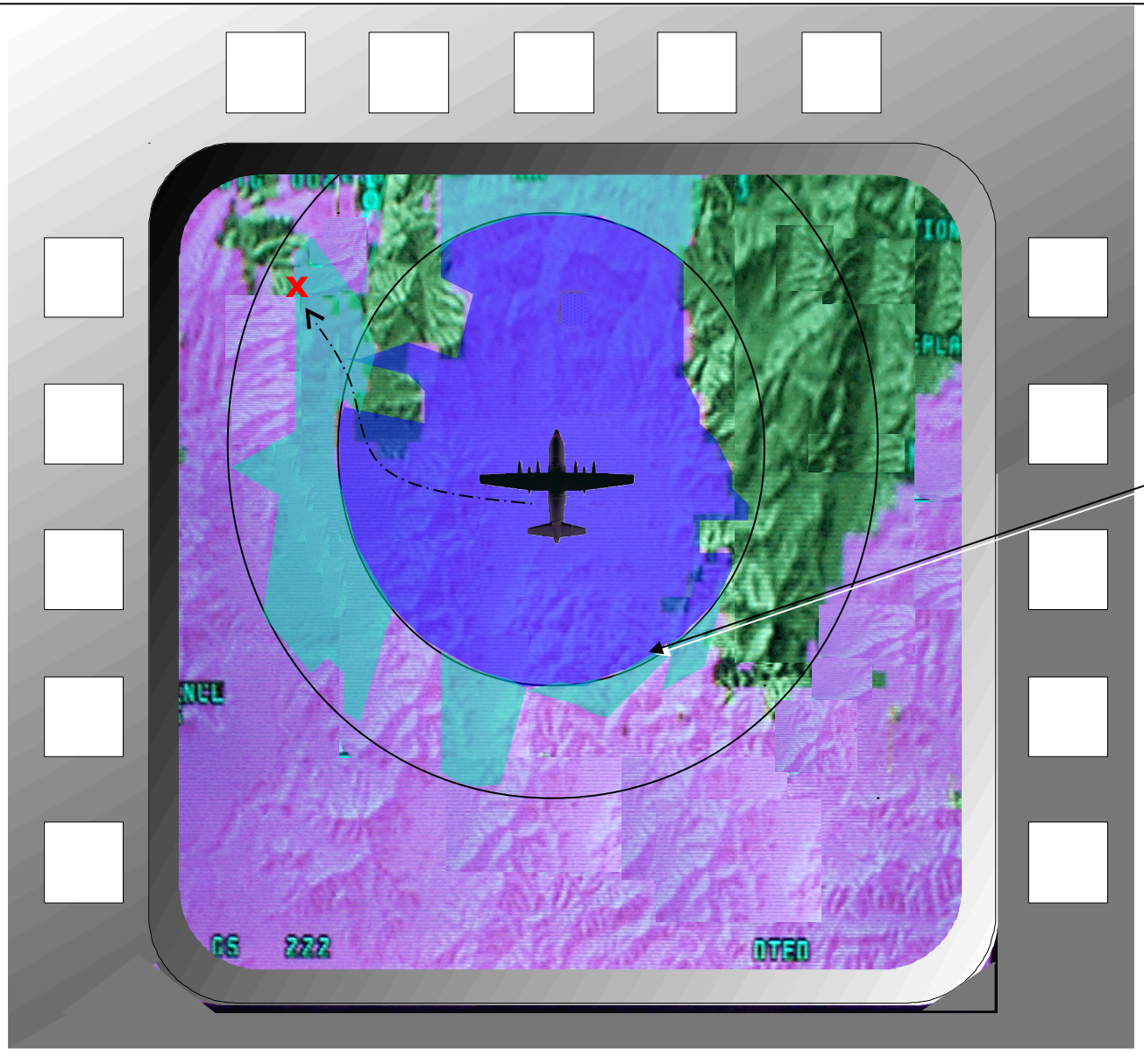
1. Acquire Target
2. Initialize Munition And Launch
3. Deploy Stabilization
4. Configure / Acquire GPS
5. Roll to heading
6. Maneuver to Attack (GPS/ INS) / Inflight target updates
7. Terminal Acquisition (Semi-Active Laser)
8. Terminal Guidance
9. Target Impact

Tactical Launcher



Ramp Launcher

Launch Acceptable Region (LAR) Tactical Display



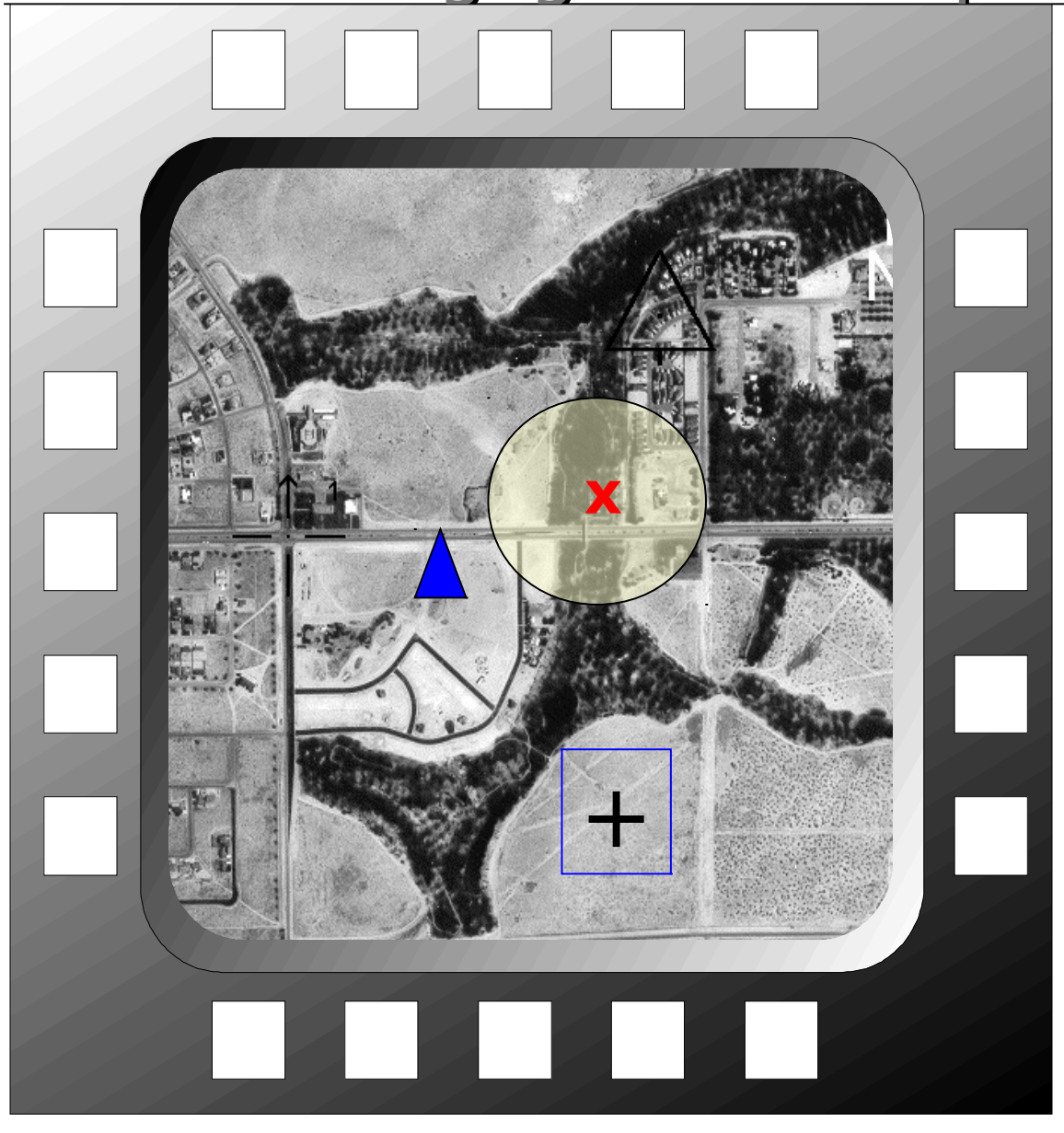
Viper Strike Mode

Top Attack

Shallow Attack

LAR at mean elevation adjusted for wind

Terminal Engagement Display



- Ground Designator

X - Target

\+ - Weapon

- Seeker planned FOV in terminal

Viper Strike Joint Applications…

MQ-9

A-10

F-35

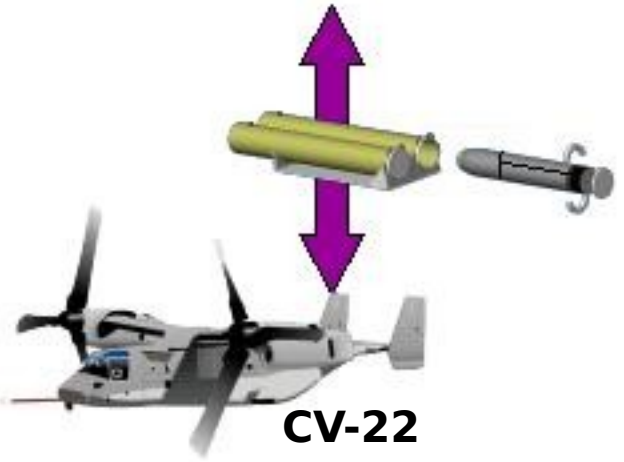
PRV

Fire Scout

C-130

MQ-1

AV-8B


CV-22

…50 lb. munition for payload-constrained, medium altitude delivery

Summary

- **Viper Strike increases weapons loadout and provides needed operational capability in today's environment**
  - **Lightweight**
  - **Top attack**
  - **Small CEP**
  - **Maneuverable**
- **Viper Strike provides the opportunity to leverage joint precision munition**
  - **Increased survivability**
  - **Greater lethality**
  - **Increased target set**